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Jewish Applications of the Greek Motif of the First Inventor (300 BCE–CE 100)*

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Introduction: The Greek Motif of the First Inventor

In this essay it will be argued that one of the modes of reinterpretation which Jews of the Graeco-Roman period employed in the process of recycling figures from Moses' Pentateuch consisted in the application of the motif of the first inventor (πρῶτος εὑρετής), which originates in Greek historiography. The applications Jews made of the Greek motif of the first inventor will be illustrated by focusing on inventions or discoveries in the field of astronomy. In recent times it has been appreciated increasingly that in the Graeco-Roman period, astronomical interest and Judaism are not necessarily mutually exclusive.[1] The cultural context in which the

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[1]See T. Barton, *Ancient Astrology* (Sciences of Antiquity), London & New York 1994, 68-70; Barton is mainly dependent on J.H. Charlesworth, "Jewish Interest in Astrology during the Hellenistic and Roman Period", in: *ANRW*, vol. 2/20/2 (1987), 926-50 (see T. Barton, *Ancient Astrology*, 219, nn. 24-26, 28). Charlesworth, "Jewish Interest in Astrology" is a slight elaboration of J.H. Charlesworth, "Jewish Astrology in the Talmud, Pseudepigrapha, the Dead Sea Scrolls, and Early Palestinian Synagogues", *HThR* 70 (1977), 183-200. See also the indexes in M. Hengel, *Judaism and Hellenism: Studies in their Encounter in Palestine during the Early Hellenistic Period*, London 1974; L.H. Feldman, *Jew & Gentile in the Ancient World: Attitudes and Interactions from Alexander to Justinian*, Princeton NJ 1993 s.v. 'astro-

Jews' Graeco-Roman contemporaries described astronomy and astronomical or astrological discoveries[2] was dominated by a thorough interest in the so-called 'history of culture'. It will be demonstrated that Jewish authors commenting on astronomical issues were no different in this respect.

It seems that the historical awareness of the rise of civilization is a typically Greek mode of thought, which developed gradually as a result of Greek colonization from the seventh century BCE onwards; this awareness manifested itself in the investigation into the first inventor (πρῶτος εὑρετής) of cultural phenomena.[3] Herodotus (c. 484-420 BCE),[4] for instance, regards the Egyptians as the inventors of a calendar based on observations of the stars (*History*, 2.4), of ceremonial worship (2.4; 2.58; 2.64), medicine (2.77; 2.84) and astrology (2.82): these are Egyptian inventions (ἐξευρημένα; see 2.82).[5] In Plato's *Phaedrus* arithmetic, geometry, astronomy

logy' and 'astronomy'. Recent publications on astronomy in 1 Enoch and in the writings of Philo of Alexandria include respectively M. Albani, *Astronomie und Schöpfungsglaube: Untersuchungen zum astronomischen Henochbuch* (WMANT, 68), Neukirchen-Vluyn 1994; A. Scott, *Origen and the Life of the Stars: A History of an Idea* (Oxford Early Christian Studies), Oxford 1991. For earlier literature on Jewish astronomy, cf. also E. Schürer, *The History of the Jewish People in the Age of Jesus Christ (175 B.C.–A.D. 135)*, vol. 3/1, ed. G. Vermes *et al.*, Edinburgh 1986, 371-72; W. Gundel, H.G. Gundel, *Astrologumena: Die astrologische Literatur in der Antike und ihre Geschichte* (SAGM, 6), Wiesbaden 1966, 51-9, 180-3, 190-1.

[2]On the interchangeability of the terms 'astronomy' and 'astrology' in the Graeco-Roman period, see W. Hübner, *Die Begriffe 'Astrologie' und 'Astronomie' in der Antike: Wortgeschichte und Wissenschaftssystematik mit einer Hypothese zum Terminus 'Quadrivium'* (AAWLM.G, 1989/no.7), Mainz & Stuttgart 1990. A clear terminological distinction between both terms is not made before Simplicius, Olympiodorus, and Cassiodorus in the sixth century CE.

[3]K. Thraede, "Erfinder II (geistesgeschichtlich)", in: *RAC*, vol. 5, 1962, cols. 1191-278; K. Thraede, "Das Lob des Erfinders: Bemerkungen zur Analyse der Heuremata-Kataloge", *RMP* 105 (1962), 158-86; A.J. Droge, *Homer or Moses? Early Christian Interpretations of the History of Culture* (HUTh, 26), Tübingen 1989, 1-48.

[4]The biographical dates of classical authors are given according to S. Hornblower, A. Spawforth, *The Oxford Classical Dictionary*, Oxford & New York [3]1996.

[5]Herodotus, vol. 1 (LCL), trans. A.D. Godley, Cambridge (Mass.) & London 1920.

and writing are inventions attributed to the Egyptian god Thoth. Some of Thoth's discoveries were subsequently praised by another god, Ammon-Thamus, though he did not hesitate to censure others of them (274C-275B).[6] It seems that this kind of historiography, concerned with the quest for the first inventor, was taken over in the Hellenistic period by historians commissioned by Hellenistic rulers to write a native history. The oldest extant example is the history of Egypt written by Hecataeus of Abdera around 300 BCE under Ptolemy I and preserved largely in the *Library of History* of Diodorus Siculus (I.10-98), compiled between about 60 and 30 BCE.[7] According to Hecataeus, the art of writing was discovered by the Egyptians (I.16.1; I.69.5; cf. I.9.2), as were medicine (I.25.2-7) and astronomy (I.9.6; I.16.1; I.28.1; I.50.1; I.69.5; I.81.4-6; cf. I.43.6). In Hecataeus' view, this astronomical knowledge was subsequently passed on to the Babylonians (I.28.1; I.81.6) and the Greeks: the famous fifth-century BCE scientist Democritus was instructed in astrology by the Egyptians; so too were his older contemporary Oenopides of Chios, and Eudoxus of Cnidus (c. 390-340 BCE): "Like the others, Eudoxus studied astrology with them and acquired a notable fame for the great amount of useful knowledge which he disseminated among the Greeks" (I.98.3-4).[8]

The historiographical interest in inventions briefly outlined here is also characteristic for the Jewish sources that will be discussed presently. It will be shown that Josephus argues similarly that Greek astronomers are dependent upon their Egyptian

[6]Plato, *Euthyphro, Apology, Crito, Phaedo, Phaedrus* (LCL), vol. 1, trans. H.N. Fowler, Cambridge (Mass.) & London 1914.

[7]See E. Schwartz, "Hekataeos von Teos", *RMP* 40 (1885), 223-62; F. Jacoby, *Die Fragmente der griechischen Historiker*, vol. 3A (Kommentar), Leiden 1954, 75-87; O. Murray, "Hecataeus of Abdera and Pharaonic Kingship", *JEA* 56 (1970), 141-71; Droge, *Homer or Moses?*, 5-8. For the text, see Jacoby, *Griechischen Historiker*, vol. 3A (Text), 22-64 (no. 264, fragm. 25); and Diodorus of Sicily, vol. 1 (LCL), trans. C.H. Oldfather, Cambridge (Mass.) & London 1933, 34-340.

[8]On Eudoxus as the first to bring particular astronomical knowledge from Egypt into Greece, cf. Seneca, *Naturales quaestiones* (LCL), trans. Th.H. Corcoran, Cambridge (Mass.) & London 1972, 7.3.2: "Eudoxus primus ab Aegypto hos motus in Graeciam transtulit".

predecessors, though in Josephus' outline the actual inventions are credited not to the Egyptians, but to the Jews (see section 2). After that, I intend to discuss Philo's view of Abraham as a proto-Platonic philosopher, whose thought prefigures Plato's view on astronomy and who is hardly dependent on any earlier tradition (section 3).[9] First, however, it will be demonstrated that the authors of 1 Enoch – the oldest literary stratum of which is dated to the third century BCE[10] – betray a similar interest in the first inventor when they attribute the invention of astronomy to Enoch, the great-grandfather of Noah (section 1). This view is held likewise by the second-century BCE author of Jubilees.[11] The idea of Enoch as the inventor of astronomy seems to have been widespread in Hellenistic Jewish thought, since it is also attested in an excerpt from the Jewish historian Pseudo-Eupolemus, who wrote in the first half of the second century BCE.[12] It is possible that Pseudo-Eupolemus was actually dependent on 1 Enoch; in any case, he developed the idea of Enoch's inventiveness further by comparing Enoch with the Egyptians. According to Pseudo-Eupolemus, "Enoch was the first to discover astrology, not the Egyptians".[13] The idea of Enoch as the first inventor (πρῶτος εὑρετής) of astronomical science is thus first attested in 1 Enoch, and it seems highly likely that the authors of the third century BCE stratum of 1 Enoch became acquainted with the Hellenistic topic of the first inventor (πρῶτος εὑρετής) during Ptolemaic rule over Palestine, which lasted for the entire third century BCE.[14]

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[9]Cf. also Droge, *Homer or Moses?*, chap. 2, esp. 35-7 (Josephus) and 47-8 (Philo).

[10]Schürer, *The History of the Jewish People*, vol. 3/1, 250-68, esp. 254-59, on matters of dating.

[11]Schürer, *The History of the Jewish People*, vol. 3/1, 308-18.

[12]On Pseudo-Eupolemus see, for example, Droge, *Homer or Moses?*, 19-25.

[13]F. Jacoby, *Die Fragmente der griechischen Historiker*, vol. 3C, Leiden 1958, 678-9, no. 724, fragm. 1.

[14]Cf., by contrast, Albani who – like scholars as J.C. VanderKam and H.S. Kvanvig before him – assumes the Enoch figure to be dependent on Babylonian traditions concerning Enmeduranki and others. Despite the fact that 1 Enoch was composed in the Hellenistic period, Albani neglects the Greek historiographical motif of the first inventor. See M. Albani, *Astro-*

The Ptolemies were the first to Hellenise Palestine, and Ptolemaic interest in the topic of the first inventor is clearly attested in Hecataeus, who had been commissioned by Ptolemy I.[15] Apart from the introduction of astronomy by Enoch, the authors of 1 Enoch are also keen to trace the origins of other inventions. These inventions are, however, ascribed to the revelations of disobedient angels. Besides notoriously evil, occult and vain inventions, these discoveries also include the "cutting of roots and trees", (i.e. medicine and botany [1 En. 7:1]), astronomy (8:3), metallurgy (65:7-8) and the art of writing (69:9). The inventions of bad angels are severely denounced by the Enochic authors. However, this criticism of particular inventions seems to be a motif that belongs to the topic of the first inventor as well. In the view of philosophers like Antisthenes (mid-5th–mid-4th cent. BCE), founder of the Cynic sect, the Cynics after him, and Epicurus (341-270 BCE), inventions exert a demoralizing influence upon humanity.[16] As we have already seen, Plato too recorded that some of Thoth's inventions were censured (*Phaedrus*, 274D-275B), including the art of writing. Similar criticism is attested in Hecataeus: Menas, the

nomie und Schöpfungsglaube: Untersuchungen zum astronomischen Henochbuch (WMANT, 68), Neukirchen-Vluyn 1994, index s.v. 'Erfinder', and 'Enmeduranki', esp. chap. 4.2.7, 261-72.

[15]For Ptolemaic rule over Palestine in the pre-Maccabean period, cf. M. Hengel, "The Political and Social History of Palestine from Alexander to Antiochus III (333-187 B.C.E.)", in: W.D. Davies, L. Finkelstein (eds.), *The Cambridge History of Judaism*, vol. 2: The Hellenistic Age, Cambridge 1989, 35-78; Idem, "The Interpenetration of Judaism and Hellenism in the Pre-Maccabean Period", in: W.D. Davies, L. Finkelstein (eds.), *The Cambridge History of Judaism*, vol. 2: The Hellenistic Age, Cambridge 1989, 167-228. On the history and culture of the Ptolemaic rulers, see G. Hölbl, *Geschichte des Ptolemäerreiches: Politik, Ideologie und religiöse Kultur von Alexander dem Großen bis zur römischen Eroberung*, Darmstadt 1994.

[16]See Thraede, "Erfinder II", col. 1217. But *pace* col. 1242 on 1 Enoch: "Zwar werden auch hier Erfindungen als Unheil verdammt, aber es handelt sich im Unterschied etwa zur kynischen Erfinder-Kritik um bestimmte Erfindungen; denn sie alle hängen mit magischer Praxis zusammen". For Cynic criticism of inventions see, for example, *The Epistles of Anacharsis*, 9:25-26, probably dating from the third century BCE (ed. F.H. Reuters, *De Anacharsidis Epistulis*, Bonn 1957, 65, 106; cf. A.J. Malherbe, *The Cynic Epistles: A Study Edition* (SBibSt, 12), Missoula (Montana) 1977, 46-7.

first king of Egypt after the reign of the gods, not only "taught the people to worship gods and offer sacrifices", but also "introduced luxury and an extravagant manner of life"; one of his successors, however, "denounced luxury and pronounced a curse on the king who had first taught the people their extravagant way of living" (1.45.1-2). In 1 Enoch the criticism of the bad angels' invention of writing and astronomy is, at the very least, somewhat ambiguous, since at the same time Enoch himself is acclaimed for his invention of astronomy, thereafter noted down in writing. As will be argued in the first section, the reason for criticizing the astronomy revealed by the disobedient angels is probably not to discredit astronomy as such, but rather to discredit a particular type of astronomy. Both types of astronomy, the Enochic astronomy and the non-Enochic, appear to be attributed to different inventors.

1 1 Enoch and Jubilees on Astronomy before the Flood:

The Derivation of Hellenistic Controversies over the Calendar from an Allegedly Antediluvian Conflict between Enoch and the 'Watchers'

1.1 Enoch

It was suggested above that early Jewish sources on astronomy were particularly interested in the question of who should be seen as the first inventor (πρῶτος εὑρετής) of astronomical science. An enigmatic description in the Pentateuch, stating that Enoch "walked with God, and then was seen no more, because God had taken him away" (Gen. 5:21-24), appeared to the authors of 1 Enoch to be susceptible to an astronomical interpretation. They took this description as evidence that Enoch was the inventor of astronomy. This remarkable interpretation of Gen. 5:21-4 suggests that the authors of 1 Enoch were acquainted with the Hellenistic topic of the first inventor (πρῶτος εὑρετής), which will have been spread through the Ptolemaic sphere of influence by Greeks like Hecataeus of Abdera. As shown in the Introduction, Hecataeus himself applied the Greek historiographical motif of the

first inventor. Only acquaintance with this motif, and a strong interest in its application, can convincingly explain what impelled the authors of 1 Enoch to transform a brief remark in Moses' Pentateuch on Enoch's extraordinary death into an elaborate account of Enoch's astronomical discoveries. According to one of the oldest strata of 1 Enoch, the *Book of the Watchers* (1 Enoch 1–36),[17] Enoch is shown the heavenly bodies by angels (17:4-5; 23:1-4; 33:2-4; 36:2-3). One of Enoch's angelic guides is Uriel, who even wrote down his revelations concerning the stars so that Enoch would remember them correctly: "he showed me everything and wrote it down, and also their names he wrote down for me, and their laws and their functions" (1 En. 33:4).[18]

This is not the only revelation by Uriel, since the entire *Book of Astronomical Writings* (1 Enoch 72–82) is in fact the result of Uriel's teaching. This is indicated clearly by the title:

> "The book of the revolutions of the lights of heaven, each as it is, according to their classes, according to their (period of) rule and their times, according to their names and their places of origin, and according to their months, which Uriel (...) showed to me" (72:1; cf. 74:2; 75:3-4; 78:10; 79:6; 80:1; 82:7-8).

This time Enoch himself writes down these revelations at the instruction of Uriel, who is a very high-ranking angel. This position consequently gives considerable authority to the astronomy of the Enochic writings, since the readers are assured that it is not self-devised but, rather, the record of a heavenly journey under the tutelage of an angel who could not be better informed.

The authority of Enochic astronomy will have been enhanced by its alleged extreme antiquity, since from the perspective of the Graeco-Roman Jewish readership of 1 Enoch these writings considerably predated Moses' Pentateuch; they dated back to antediluvian times, to someone whose great-grandfather – according to

[17] Schürer, *The History of the Jewish People*, vol. 3/1, 255-6.

[18] For text edition and translation, see M.A. Knibb, *The Ethiopic Book of Enoch: A New Edition in the Light of the Aramaic Dead Sea Fragments*, vol. 1: Text and Apparatus; vol. 2: Introduction, Translation and Commentary, Oxford 1978.

the genealogical list in Gen. 5:1-24 – was Adam's great-grandson. This is indeed a very ingenious sort of recycling, by which the 'recycled product' is dated before the original material. Besides, the recipients of these writings will have been impressed by the dramatic fact that the Enochic writings, noted down by Enoch for his son Methuselah and his descendants (e.g. 76:14; 81:5; 82:1), apparently survived the all-destructive deluge by being protected aboard the ark of Enoch's great-grandson, Noah.[19]

The astronomy of 1 Enoch is understood, therefore, not only to be revealed by the very angel in charge of the heavenly bodies, but also to be noted down by an antediluvian sage whose writings predated the Mosaic Pentateuch. In the view of the Jubilees author, who wrote in the second century BCE and is indeed in numerous places dependent on 1 Enoch,[20] the Enochic writings were the oldest literary product of all, and their author the first discoverer of writing: "This one [= Enoch] was *the first who learned writing* and knowledge and wisdom, from (among) the sons of men (...). And who wrote in a book the signs of heaven according to the order of their months" (Jub. 4:17).[21]

1.2 The 'Watchers'

From the very outset, however, according to both 1 Enoch and Jubilees, this highly authoritative astronomy stood in competition with another, which was also revealed by angels. The circumstances in which this alternative astronomy emerged are mentioned in the *Book of the Watchers*. Building on the narrative in Gen. 6:1-4 about the sons of God (בְּנֵי־הָאֱלֹהִים) having intercourse with the beautiful daughters of mortals, the author interprets this event as the fall of a group of angels – the so-called

[19]See also the Noachic passage 1 En. 68:1, where Noah makes reference to the writings of Enoch. On Noachic excerpts from a *Book of Noah* in 1 Enoch, see Schürer, *The History of the Jewish People*, vol. 3/1, 253, 260, 332-3.

[20]Schürer, *The History of the Jewish People*, vol. 3/1, 308-18, esp. 311 and 315.

[21]Translation taken from O.S. Wintermute, "Jubilees", in: J.H. Charlesworth (ed.), *The Old Testament Pseudepigrapha*, vol. 2, New York, etc. 1985, 35-142.

'Watchers' (1 En. 1:5; 12:2, 4; 13:10; 14:1, 3; 15:2, 9; 16:1-2) – who subsequently initiate mankind into all kinds of lore and sciences, including astronomy (1 En. 6:1–8:4): "Baraqiel [taught] astrologers, and Kokabel portents, and Tamiel taught astrology, and Asradel taught the path of the moon" (1 En. 8:3). In 1 Enoch it remains unclear how this astronomical revelation by fallen angels relates chronologically to the revelation received by Enoch; the Pentateuch suggests that the sons of God (בְּנֵי־הָאֱלֹהִים) appeared in Noah's days, thus after Enoch, but even here the statements are too vague to enable one to draw firm chronological conclusions.

The author of Jubilees, however, noticed this imprecision in Genesis and 1 Enoch, and tightened the chronological framework; studying the genealogical report on the lineage from Adam to Noah in Gen. 5:1-32, he took the name of Enoch's father, Jared, to be a derivative of ירד (= come or go down, descend) and concluded: "he [= Jared's father, Mahalalel] called him Jared because in his days the angels of the LORD, who were called Watchers, *came down* to the earth in order to teach the sons of man, and perform judgment and uprightness upon the earth" (Jub. 4:15). The purpose of executing judgment and uprightness on earth remains in marked contrast with the libidinous intentions which – according to 1 Enoch – the angels already had before their descent from heaven (see esp. 1 En. 6:1-2). According to the author of Jubilees, however, the Watchers came down with a divine mission to instruct mankind,[22] and started to sin only later during their residence on earth. The Watchers descended to earth in order to teach (Jub. 4:15) and instructed Enoch as their most gifted student, who became the first literate human being and the author of an astronomical book (Jub. 4:17), as he had been initiated by the Watchers into "everything which is on earth and in the heavens" (Jub. 4:21). In spite of that, suddenly Enoch had to bear witness against the Watchers when "they *began* to mingle themselves with the daughters of men" (Jub. 4:22) and transgressed "the mandate of their authority" (Jub. 7:21). Only then, apparently, did they

[22]Cf. Jub. 5:6: "against his angels whom he had sent to the earth he [= God] was very angry", and 7:21: they received a "mandate".

start releasing dangerous astronomical information of a different kind than the astronomy taught to Enoch. The evidence for the evil nature of this astronomy is that after the deluge one of Noah's great-grandsons, Cainan, son of Arpachshad, is reported to have found a writing engraved on stone by his ancestors. Once transcribed, this writing is shown to consist of "the teaching of the Watchers by which they used to observe the omens of the sun and moon and stars within all the signs of heaven" (Jub. 8:3). The author of Jubilees mentions explicitly that Arpachshad's son "sinned" in transcribing such a writing and not telling his great-grandfather Noah, who would have been angry with him (Jub. 8:3-4). It is also suggested that the resurfacing of the demons after the Flood among Noah's immediate descendants is connected with this preservation and spread of astronomical writings by the Watchers, the "fathers of these spirits" (Jub. 10:1-6). There seems to have been a shift in the contents of the astronomical teachings by the Watchers after their transgression, since otherwise – if these had not differed from the astronomy they originally revealed to Enoch – their writings would not have had to be forbidden. The author of Jubilees thus elucidates the unclear chronological relation which existed in 1 Enoch between the astronomical revelation made by the fallen angels, and that by Uriel to Enoch. In Jubilees, these conflicting revelations of astronomy have been put in a clear sequence: by means of an etymological interpretation of the name Jared, the author of Jubilees traces the beginning of the Watchers' instruction back to the days of Enoch's father, and it is only later, when they have already taught Enoch, that they transgress and seem to alter their astronomy.

What remains puzzling, however, is the sense in which the two different types of astronomy actually differ. Of course, the 'non-Jewish' type of astronomy is depicted as "demonic" (Jub. 10:1-6), and the Enochic author of the *Book of the Watchers* tries to differentiate between the two conflicting astronomies by stating that the Watchers did not have access to the real heavenly mysteries and knew only a "worthless mystery" (1 En. 16:2-3). But in what sense were "astrology", the knowledge of "portents", the teaching of the "path of the moon" (1 En. 8:3) and the "teaching of the

Watchers by which they used to observe the omens of the sun and moon and stars within all the signs of heaven" (Jub. 8:3) substantially and explicably different from the more appropriate type? How did the antediluvian astronomies actually conflict in the perception of the authors of 1 Enoch and Jubilees? Some progress in solving the problem concerning the actual difference between the two antediluvian astronomies can be made by addressing the related question of whether there are any restrictions in Jewish astronomy as devised in 1 Enoch and Jubilees. In the following section, it will be suggested that the specific astronomical views endorsed by the authors of 1 Enoch and Jubilees can be inferred by examining their writings in relation to contemporary views with which they apparently took issue. The dissimilarities between Enochic and contemporary non-Enochic astronomy might offer a clue as to how the antediluvian astronomies were thought to differ.

1.3 Criticism of Non-Enochic Calendar Systems

The author of the *Book of Astronomical Writings* (1 En. 72–82) seems to have unfolded his Enochic astronomy with continuous reference to other astronomical views which he actually considers dangerous. These alternative astronomies involve other calendrical systems at variance with Enoch's solar calendar of 364 days, and differing views on planetary movement.

The first alternative astronomy appears in passages where the author tries to harmonize a solar calendar of 364 days with a lunar one. First the course of the sun through 2x6 gates at the horizon is described without reference to the concomitant movement of the moon (1 En. 72:2-37). There follows a report on the lunar movements, this time with close attention to the way these movements relate both to the sun and to the gates of the horizon (73:1–74:9). In conclusion, the author makes an attempt to prove the two reckonings compatible (74:10-6). This attempt is doomed, however, since the author has to conclude that the moon continuously falls behind the sun by ten days a year (74:10-6; 79:3-5). This leads inevitably to a different relationship between sun, moon and gates, though this is not yet openly acknowledged.

One of the authors of the Dead Sea Scrolls (4Q317) still makes an effort to improve on this harmonisation.[23] By comparison with these efforts to harmonize a lunar and solar calendar, the author of Jubilees represents a later developmental stage when he too notes the discrepancy between the two calendrical systems, but exclusively validates the solar calendar by eliminating the other one. Straight after Noah's disembarkation, the observance of a 364-day calendar comes into effect and Noah is already warned against "those who will examine the moon diligently because it will corrupt the (appointed) times and it will advance from year to year ten days" (Jub. 6:32-8).[24] This calendrical controversy seems to be at the heart of 1 Enoch, Jubilees and the Dead Sea Scrolls,[25] and to reflect a struggle which became an internal Jewish affair. Philo is still aware of this struggle: he advocates the vernal equinox as the proper calendrical starting point in order to avoid divergent views on the beginning of the year, due to the fact that "(some) reckon by the sun, others by the moon" (Quaest. in Exod., I.1).[26] It seems likely that the idea of an antediluvian competition between two different astronomical systems, as attested in 1 Enoch and Jubilees, is the extension of contemporary tensions back into primordial times in an attempt to ideologize one position to the detriment of its alternative; therefore, these alternative non-Enochic astronomies are credited to different inventors. The 'appropriate' astronomical system is traced back to

[23] Cf. Albani, *Astronomie und Schöpfungsglaube*, 87, 91-2.

[24] Cf. Albani, *Astronomie und Schöpfungsglaube*, 118-9, 87, 280-1.

[25] Cf., for example, E. Isaac, "1 (Ethiopic Apocalypse of) Enoch", in: J.H. Charlesworth (ed.), *The Old Testament Pseudepigrapha*, vol. 1, New York, etc. 1983, 9 on 1 Enoch, and Wintermute, "Jubilees", 39, 48 on Jubilees. For the DSS, see the concern about time reckoning in 1QpHab 11:6-8 (ed. E. Lohse, *Die Texte aus Qumran: hebräisch und deutsch*, Darmstadt ^{2}1971, 240) and 1QH 4:11-2 (Idem, *Die Texte aus Qumran*, 124). On calendar and controversy over calendrical issues in the DSS, cf. S. Talmon, "Kalender und Kalenderstreit in der Gemeinde von Qumran", in: Idem, *Gesellschaft und Literatur in der hebräischen Bibel* (Gesammelte Aufsätze, 1), Neukirchen-Vluyn 1988, 152-89.

[26] Text edition and translation of Philo's writings in Philo, 12 vols. (LCL), trans. F.H. Colson, G.H. Whitaker and R. Marcus, Cambridge (Mass.) & London 1927-62.

the discoveries of Enoch, who had been taught by (still) righteous angels, whereas the other system is attributed to the teaching of fallen angels.

The importance of calendrical issues in the *Book of Astronomical Writings* is underlined by another alternative calendar which is criticized even though it is solar (1 En. 75:1-2; 82:4-6; 82:7-20). The deviation from the correct solar system lies in the observance of a solar year of 360 days. In this case, the four leaders who divide the four parts of the year (82:11), namely Melkiel, Helemmelek, Meleyal and Narel (82:13; 82:15-7; 82:18-20), are ignored. The people who observe the alternative calendar do not appreciate that the "leaders of the heads of thousands who (are) in charge of the whole creation and in charge of all the stars" also have to do with those days which, according to Enoch, come in addition to the 360 days (75:1). Because of the "four days which are not counted in the reckoning of the year" people go wrong (75:1-2). Their ignorance of the seasonal leaders is sinful, and contrasts sharply with the views of adherents of the Enochic calendar who "do not sin like the sinners in the numbering of all their days in which the sun journeys in heaven" (82:4). This ignorance is not really deliberate hostility against the leaders who divide the seasons but is due rather to the fact that people "do not know them exactly" because of the wrong astronomical system they adhere to (82:5). This system conflicts clearly with the exact computation as revealed by Uriel (82:7), which consists of a solar year of 360 days with 4 inter-seasonal days in addition (82:11). The *Book of Astronomical Writings* is thus to be understood not only against the background of a competition between lunar and solar calendars, but also with regard to the question of two competing solar reckonings.

1.4 Enochic Views on the Planets

According to the Enochic writings, alternative astronomical models are not only sinful but dangerous as well. The innate danger of non-Enochic astronomies is made particularly clear in a passage of the *Book of Astronomical Writings*, where Uriel predicts that at the end of days many of the "heads of the stars" will err and

disobey their orders by changing their courses and by not appearing during their prescribed seasons. These modifications convince the "sinners" that the stars are divine; the eventual result, however, is the multiplication of evils, punishment, and destruction (1 En. 80:6-8). Uriel's prediction occurs at the end of his astronomical revelations to Enoch (72:2–78:17), and is accompanied by an exhortation that Enoch "may see this sun, and this moon, and those who lead the stars of heaven, and all those who turn them, their tasks, and their times, and their rising" (80:1). Enoch and the readers of his writings have been endowed with an astronomy which enables them to distinguish between the normal courses of celestial bodies and the aberrations of certain stars in the future (80:6) which will eventually lead to total destruction.[27] Although these aberrations are formally expected to happen in future times, it seems highly probable that the Graeco-Roman author of the *Book of Astronomical Writings* aimed to interpret the planetary movements which he observed in his own times as the fulfilment of an allegedly ancient prediction concerning the irregular and erring courses of certain stars. In this sense, Uriel's prediction is in fact a vaticination after the predicted event (*vaticinium ex eventu*) so that the Graeco-Roman readers of the Enochic writings would realize that the end of time was currently dawning. A supporting argument consists in the fact that, besides the planets, the moon itself is thought to contribute to this eschatological disobedience in heaven (1 En. 80:4-5); as was noted above (section 1.3), the moon had already come under suspicion in the author's attempt to harmonize its course with the sun (1 En. 74:10-6; 79:3-5), but it is now openly acknowledged to be untrustworthy. For that reason, not only the eschatological aberration of the moon (80:4-5), but also that of the planets (80:6) was probably based on *present* astronomical observations. Moreover, in the *Book of the Watchers* Enoch is already shown the prison house for the seven stars which "transgressed the command of the Lord *from the beginning of their rising* because they did not come out at their proper times" (1 En. 18:10-6), and later he sees these seven stars again among the

[27] Cf. Albani, *Astronomie und Schöpfungsglaube*, 337-8.

stars of heaven which have sinned against the divine commandments (21:1-6; cf. 20:4). It seems that the authors both of the *Book of the Watchers* and of the *Book of Astronomical Writings* describe the same phenomenon, the irregular movements of the planets and the sidereal constellations they pass through; these complexities apparently surpassed the mathematical competence of Enochic astronomy.[28] Both authors regard the irregularity of the planets as an indication of the existence of evil and conflict in heaven, blurring its order. This concept may have contributed considerably to the growth of Gnosticism in later times,[29] and was explicitly countered by Philo in the first century CE. According to Philo, the term πλάνητες ('wanderers', 'planets') is very inappropriate since planets do not wander and stray along the heavens irregularly, because "sharing as they do in a blessed and divine and happy nature, they are all intrinsically free from any such tendency" (*Dec.*, 104). The fact that the motion of the planets is contrary to that of the fixed stars was mistakenly taken by people who projected their own wandering upon the planets to mean that these bodies actually wandered around (*Dec.*, 102-4). This contrasts sharply with the view, expressed in the *Book of Astronomical Writings*, that not only people but also the planets themselves err: erring individuals and planets together constitute a vicious circle which ends in final destruction (1 En. 80:6-8).[30] This negative assessment of the planetary movements compelled the authors of 1 Enoch to modify the motif of the first inventor (πρῶτος εὑρετής), and to construct an antediluvian controversy between the inventors of two different kinds of astronomy: Enoch is the first inventor (πρῶτος εὑρετής) of the 'right astronomy' whereas the angelic Watchers were the first to teach the aberrant type of astronomy, leading to eschatological destruction.

[28] Albani, *Astronomie und Schöpfungsglaube*, index s.v. 'Planeten', 383, but esp. 98, 115-6, 120, 128, 131, 249-55, 301 (esp. n. 91).

[29] A. Scott, *Origen and the Life of the Stars: A History of an Idea* (Oxford Early Christian Studies), Oxford 1991, 90-103, esp. 91-3, with reference to 1 Enoch.

[30] Cf. the interesting observation of E. Rau referred to by Albani, "daß hinter den verschiedenen äthiopischen Begriffen für 'irren' in 1 Hen. 75:2; 80:6, 7; 82:5 das griechische Wort πλανᾶσθαι steht" (Albani, *Astronomie und Schöpfungsglaube*, 115).

2 Josephus on Astronomy before and after the Flood:

The Construction of an Uninterrupted Transmission of Astronomical Knowledge through Seth's Descendants via the Chaldeans, Abraham and the Egyptians to the Greeks

2.1 Astronomy before the Flood: Seth's Descendants

The interest in Enoch's astronomical discoveries in 1 Enoch and Jubilees is in marked contrast to the status of Enoch in the literary corpus of Philo and Josephus, both writing in the first century CE. Philo mentions this antediluvian sage by name in four passages, but in none of them does he pay any attention to Enoch's engagement in astronomy.[31] The same holds true for Josephus, where Enoch's name occurs in three passages, but again without any allusion to his astronomical revelations.[32] Enoch's relation with astronomy is, however, mentioned briefly by the Jewish historian Pseudo-Eupolemus (second century BCE), according to whom Enoch is identical with Atlas; he, and not the Egyptians, was the first to discover astronomy.[33]

Philo not only makes no mention of these discoveries, but also ignores antediluvian astronomy in general. The theme is not, however, absent from Josephus' writings; indeed he has an unreservedly positive appreciation of this astronomy. According to him, it was the descendants of Adam's son Seth who discovered the "science of the heavenly bodies and their orderly array" (*Ant.*, I. 69).[34] In order to prevent their discoveries (εὑρημένα) from loss in the universal destruction of the deluge already predicted

[31]See *Poster. C.*, 40-4; *Mut. Nom.*, 34-8; *Abr.*, 17-26; and *Quaest. in Gen.*, I.82-6 (cf. the Greek fragment of *Quaest. in Gen.*, III.11).

[32]See *Ant.*, I.79, 85-6; IX.28.

[33]F. Jacoby, *Die Fragmente der griechischen Historiker*, vol. 3C, Leiden 1958, 678-9, no. 724, fragm. 1.

[34]Text edition and translation of Josephus' writings in Josephus, 10 vols. (LCL), trans. H.St.J. Thackeray, R. Marcus, A. Wikgren and L.H. Feldman, Cambridge (Mass.) & London 1926-65.

by Adam, Seth's descendants engraved their teachings on a pillar of stone, which – as Josephus explicitly remarks – "exists to this day in the land of Seiris" (*Ant.*, I.69-71). One of the reasons for the longevity accorded by God to Seth's descendants was that only by living for the whole period of the "great year",[35] which in Josephus' calculation consists of 600 years, would they be able to "promote the utility of their discoveries in astronomy and geometry" and to develop accurate predictions (*Ant.*, I.106); the duration of this longevity gradually diminished until Moses, after whom the age limit became 120 years (*Ant.*, I.152). There is a remarkable similarity between Josephus' account of the ancient astronomical writings preserved in stone to withstand the deluge, and the report given in Jubilees (Jub. 8:3-4), concerning comparable writings of stone which also endured the same catastrophe and were discovered by Arpachshad's son Cainan (see section 1.2 above). But despite this similarity, the two accounts vary in their interpretation. In Josephus, true astronomical discoveries are not credited exclusively to Enoch as in the Enochic writings and Jubilees, but to Seth's descendants in general. And unlike the two writings permeated by admiration of Enoch, Josephus does not make any mention of any disagreement over astronomical matters in the antediluvian period. It is difficult to tell whether Josephus deliberately ignores this controversy which is so well attested in 1 Enoch and Jubilees; one might be tempted to think so, since both writings, and 1 Enoch in particular, seem to have been reasonably well known in the first century CE.[36] How can this indifference be accounted for?

[35]On the concept of the 'great year', see A.A. Long, D.N. Sedley, *The Hellenistic Philosophers*, vol. 2: Greek and Latin texts with Notes and Bibliography, Cambridge, etc. 1987, nos. 52C-D, pp. 306-307, with further bibliography.

[36]See the discussions in Isaac, "1 (Ethiopic Apocalypse of) Enoch", in: Charlesworth (ed.), *The Old Testament Pseudepigrapha*, vol. 1, 8-10, on 1 Enoch: "It [= 1 Enoch] was used by the authors of Jubilees, the Testaments of the Twelve Patriarchs, the Assumption of Moses, 2 Baruch, and 4 Ezra" (p. 8); and in Wintermute, "Jubilees", vol. 2, 49-50 on Jubilees.

2.2 Astronomy after the Flood: Abraham, the Chaldeans, the Egyptians and the Greeks

Josephus' disinterest in the antediluvian controversy over astronomical systems can most probably be explained by his apologetical tendency to ascribe the discovery of astronomy exclusively to the Jews. In his *Contra Apionem*, Josephus aims to demonstrate – as he had in his *Antiquities* – the extreme antiquity of the Jews (*Apion*, I.1-3), and he argues against the "current opinion that, in the study of primeval history, the Greeks alone deserve serious attention" (*Apion*, I.6). In Josephus' view the reverse is the case: Greek astronomers, for instance, derived their knowledge from the Egyptians and Chaldeans (*Apion*, I.14). This dependency had already been stressed in the *Antiquities*, where Josephus, in his comments on the period of Abraham's residence in Egypt (Gen. 12:10-20), makes clear that Greek astronomy is dependent on the Egyptians who, in turn, rely upon Chaldean astronomy as mediated to them by Abraham: "before the coming of Abraham the Egyptians were ignorant of these sciences, which thus travelled from the Chaldeans into Egypt, whence they passed to the Greeks" (*Ant.*, I.167-8). Abraham's interest in astronomy is also related by the Jewish historians Pseudo-Eupolemus and Artapanus, both of whom wrote in the second century BCE.[37] In Josephus' view, the Chaldeans, therefore, are credited with the inauguration of astronomy. That does not mean, however, that the invention of astronomy is non-Jewish in origin, since the Jews and the Chaldeans are closely related. The Chaldeans are the original ancestors of the Jewish race, so that there actually exist ties of family connection between them (*Apion*, I.71). This kinship consists in Abraham's provenance from Chaldea and, according to Josephus, his knowledge of astronomy is alluded to by no less an authority than Berossus (*Ant.*, I.158), whom Josephus knows to be "familiar in learned circles through his publication for Greek readers of works on Chaldean astronomy" (*Apion*, I.129). Strikingly,

[37] Jacoby, *Die Fragmente der griechischen Historiker*, vol. 3C, 678-9, no. 724, fragm. 1 (Pseudo-Eupolemus); 680-1, no. 726, fragm. 1 (Artapanus).

Josephus' view on the transmission of astronomy has important similarities with Hecataeus'. As mentioned in the Introduction, Hecataeus holds the view that not only the Greek astronomers are dependent on Egyptian instruction (I.98.4: "Like the others, Eudoxus studied astrology with them [= the Egyptians] and acquired a notable fame for the great amount of useful knowledge *which he disseminated among the Greeks*"), but also the Babylonians: "the Chaldeans of Babylon, being colonists from Egypt, enjoy the fame which they have for their astrology because they learned that science from the priests of Egypt" (I.81.6; cf. I.28.1). Although Josephus agrees with the dependency of Greek astronomers upon Egypt, he has to construct the relation between the Egyptians and the Babylonians differently in order to accommodate the Jews: the Jews transmitted astronomical knowledge from the Chaldeans to Egypt.

According to Josephus, the Chaldeans in turn have a genealogical link with Noah since their founder is Arphaxades [= Arpachshad], grandson of Noah: "Arphaxades named those under his rule Arphaxadeans, the Chaldeans of today" (*Ant.*, I.143-4). This clear identification of the Chaldeans as the descendants of Arphaxades was already conjectured by the author of Jubilees in his elaboration of the genealogy of Arphaxades' father as given in the Pentateuch (Gen. 10:21-30; 11:10-32): "to *Arpachshad* was assigned the third portion, all of the land of the region of *Chaldea* toward the east of the Euphrates" (Jub. 9:4). Despite this, Josephus and the author of Jubilees interpret this identification quite differently. As we have seen, the author of Jubilees focuses on the transgression of Arpachshad's son Cainan, whom he holds responsible for the discovery, transcription and spread of the Watchers' astronomical teaching after the deluge (Jub. 8:3-4; see section 1.2 above). In Josephus, however, Arpachshad establishes the connection between the highly regarded antediluvian astronomy of Seth's descendants on the one hand, and Chaldean astronomy on the other hand, as if they were a continuum. Although the idea of this connecting point is not worked out by Josephus, it seems clear that it lingers at the back of his mind. It is exactly here that the two independently developed lines of 'Sethian' and Chaldean

astronomy overlap: Arpachshad, grandson of Noah and ancestor of the Chaldeans. This seems to reflect Josephus' apologetical interest in tracing Jewish astronomy as far back as possible.

This is not to say that critical remarks on Chaldean astronomy do not occur at all in his writings (see *Ant.*, I.154-6), but, even after his 'conversion', Abraham is nevertheless portrayed as the transmitter of Chaldean astronomy to the Egyptians, and eventually to the Greeks. This is again at odds with Jubilees, where Abraham acknowledges the uselessness of his astronomical observations, which he had made to see "what the nature of the year would be with respect to rain". In Jubilees such observations are deemed useless since everything is subject to God's instant desire (Jub. 12:16-8). This negative evaluation of Abraham's astronomy appears to be inconsistent with the importance accorded by the author of Jubilees to Enoch's discoveries (Jub. 4:17-8) but he apparently lacked the apologetical impetus that propelled Josephus into his grand construction of one uninterrupted tradition of Jewish astronomy. Whereas in the perception of the author of Jubilees, Abraham declined the validity of astronomy, Josephus holds that Abraham actually lectured on it in Egypt.

3 Philo on Abraham's Astronomy:

The Characterization of Abraham as a Proto-Platonic Critic of Materialist Astronomy

This interest in apologetics was shared by Philo, though with notable variations. According to Philo too, the Chaldeans especially were engaged in the elaboration of astronomy (*Abr.*, 69; *Congr.*, 50). They acquired the reputation of having pursued it to a considerably higher level than other peoples. Their astronomy is based on the assumption that there exists a harmony between heavenly bodies and things on earth as the result of a sympathetic affinity between the different parts of the universe, a view to which Moses seems to subscribe (*Mig. Abr.*, 178, 180), and which is certainly shared by Abraham, who was himself a Chaldean (*Cher.*, 4; *Gig.*, 62; *Abr.*, 70). In this, the Chaldeans are contrasted with the sceptics who lack any interest at all in astronomy (*Congr.*, 52).

Another description of this category of people uninvolved in astronomy shows an interesting difference from Josephus. In Josephus the mediation of Chaldean astronomy by Abraham to the Egyptians, on whom the Greek astronomers subsequently depended, is crucial for his argument. This mediation in which the Egyptians are thought to play a role is, however, ruled out by Philo: the character of the Egyptians is "atheistical in its preference for earth above heaven, for the things that live on the ground above those that dwell on high" (*Fug.*, 180); as regards their deification of earth and their lack of reverence for heaven, they are "almost alone among the nations" (*Vit. Mos.*, II.194-5). Although Philo is dealing here with the troublesome period of the Egyptian suppression of the Jews in Moses' day, there is reason to believe that these passages also reflect growing tensions experienced by Alexandrian Jews in the first century CE: similar derogatory allusions to impious worship of animals amongst the Egyptians occur in Philo's *Legatio ad Gaium*. In this writing the Egyptians are depicted, for instance, as "a seed bed of evil in whose souls both the venom and the temper of the native crocodiles and asps were reproduced" (*Leg. Gai.*, 166; cf. 139, 163).[38]

Philo's negative view about the lack of Egyptian interest in astronomy is all the more surprising when one realizes that Egypt was widely considered to be an important source of Greek astronomy. I have already noted that, according to Hecataeus of Abdera (around 300 BCE), the Greeks Democritus, Oenopides and Eudoxus all received instruction on astrology from the Egyptians. Similar views appear in the writings of Herodotus (c. 484-420 BCE) and Plato, although these views were generally simultaneously mitigated by the several modes of the 'interpretatio graeca'

[38]Cf., by contrast, Plutarch, *Moralia* (LCL), vol. 5, trans. F.C. Babbitt, Cambridge (Mass.) & London 1936, *De Iside et Osiride*, 379D-382C: despite criticism of the Egyptian practice of treating animals as gods (379E-380E), Plutarch points to the usefulness and the symbolism of the animals held in honour by the Egyptians (380F-381D), thus rendering the Egyptian reverence for animals acceptable to the Greeks (381D-382C). See, for example, the symbolic interpretation of the crocodile in 381B-C, and of the asp in 380F-381B.

by which Greek writers endeavoured to retain their self-respect.[39] Strikingly, it is the introduction of Plato's *Timaeus*, the writing used so considerably by Philo, which displays a high estimation for Egypt (21E-25D).[40] Moreover, in the early first century CE, Tiberius' astrologer Claudius Thrasyllus of Alexandria (†36 CE) refers to the authority of Nechepso and Petosiris as Egyptian astrologers.[41] Slightly later, Thessalus of Thralles makes mention of a book by Nechepso on the curing of illnesses according to the zodiac by means of stones and plants (ed. Friedrich, lib. I, prooem., para. 6).[42] Philo's neglect of Egyptian astronomy is all the more striking since he probably knew at least two contemporary Alexandrian astronomers: Balbillus – who was almost certainly the son of Thrasyllus of Alexandria mentioned above – but possibly also Chaeremon of Alexandria formed part of the Alexandrian embassy sent to Rome in 41 CE on behalf of the city, to present Claudius with the official apologia for the recent anti-Jewish disturbances in which Philo too had been involved.[43]

Thus, although Philo does acknowledge the Chaldean background of Abraham, the outline of his apologetics is at variance with Josephus, since Philo has a low opinion of the Egyptians and never makes any effort to set the discovery and elaboration of as-

[39]Cf. K. Thraede, "Erfinder II (geistesgeschichtlich)", in: *RAC*, vol. 5, 1962, cols. 1204-7 (on Egypt as origin of culture), 1211-3 (on the 'interpretatio graeca') and 1221-2 (on Greek philosophers visiting Egypt). For a critical attitude towards the orientalising view on inventions see Straton of Lampsacus, an Aristotelian philosopher of the third century BCE (cols. 1230-1).

[40]Plato, *Timaeus, Critias, Cleitophon, Menexenus, Epistles* (LCL), vol. 9, trans. R.G. Bury, Cambridge (Mass.) & London 1929.

[41]This is the first allusion to Nechepso and Petosiris which can be dated reliably. See G. Fowden, *The Egyptian Hermes: A Historical Approach to the Late Pagan Mind*, Cambridge, etc. 1986, 3, n. 11.

[42]H.-V. Friedrich (ed.), *Thessalos von Tralles: griechisch und lateinisch* (Beiträge zur klassischen Philologie, 28), Meisenheim am Glan 1968, 47.

[43]H.I. Bell, *Jews and Christians in Egypt: The Jewish Troubles in Alexandria and the Athanasian Controversy* (Greek Papyri in the British Museum, 6), London 1924, 1-37, esp. 5, 10-21, 23 (text: lines 16-7); see also the commentary on lines 16-7 on page 29. This information is found in a letter by Claudius to the Alexandrines (41 CE). For the text of this papyrus (no. 1912), see 23-6.

tronomy into an uninterrupted and accumulative tradition which passes from one nation to another. He speaks only quantitatively about the higher degree of the Chaldeans' commitment to astronomical science, and credits nobody with the first discovery of it as such.

The core of Philo's apologetical interest is made up rather of his characterization of Abraham as a kind of Plato, proceeding from the visible objects in astronomy towards the immaterial and conceptual. Astronomy is the queen of sciences (*Congr.*, 50), and sight – the starting point of understanding (*Abr.*, 161-2) – is the most excellent of the senses since by it mankind apprehends the heavenly bodies (*Abr.*, 57). It is out of these astronomical observations that philosophy grew (*Op. Mund.*, 54): sight inaugurated the road to philosophy by its observation of celestial phenomena (*Quaest. in Gen.*, II.34). The soul investigating the realm of the visible has, however, to proceed further to the immaterial and conceptual (*Praem. Poen.*, 26) and to see through the celestial phenomena observed by sight to the "higher paradigmatic forms" and the "cause of all things" (*Quaest. in Gen.*, II.34). This was the ascent Abraham made when he advanced from astronomy to the intelligible world, the commonwealth of imperishable and incorporeal ideas (*Gig.*, 61-64); he attained to an intelligible order of things outside the sphere of the senses (*Abr.*, 77). In this, Philo is indeed dependent on Plato, who, though genuinely interested in astronomical research, nevertheless regards it as of secondary importance: true astronomy looks further than the sense-perceptible heaven, to the "superheavenly place".[44] Philo's portrayal of Abraham's ascent, on the basis of astronomical observations, to the paradigmatic and intelligible world shows not only the virtue, but also the limitations of astronomy, since astronomy itself has to be transcended in a Platonic movement towards the ideas. This criticism which Abraham supposedly applied to Chaldean astronomy

[44] A. Scott, *Origen and the Life of the Stars: A History of an Idea* (Oxford Early Christian Studies), Oxford 1991, 7-8. Studies on Philo's dependance on Plato include, apart from Scott, *Origen and Life of the Stars*, 7-18 (Plato), 63-75 (Philo), also D.T. Runia, *Philo of Alexandria and the Timaeus of Plato* (PhAnt, 44), Leiden 1986, which is entirely devoted to this topic.

is almost the same as Plato's refutation of Ionian astronomers who assumed that the world had come into being by nature and chance.[45] In this way, Plato's reflections on astronomy are prefigured by those carried out by Abraham.

Conclusion: Jewish Applications of the Greek Motif of the First Inventor

In this essay I focused on the context in which the invention of Jewish astronomy was discussed in the Graeco-Roman period. One can conclude that, as in Graeco-Roman writings, astronomy is related to the debate on the history of culture, showing the same interest in the motif of the first inventor (πρῶτος εὑρετής) as was encountered in Herodotus, Plato and Hecataeus of Abdera. In 1 Enoch this motif is applied as a historiographical tool to trace the genesis of a contemporary controversy over the correct calendar back to primordial times. The opponents' calendar is thought to derive from malicious inventors, whereas the correct calendar is attributed to the discoveries made by Enoch (section 1). This view is shared by the author of Jubilees. Josephus, however, knew of no such controversy over calendrical systems and developed an uninterrupted tradition of astronomy in which special credit is given to Abraham, who mediated astronomy to the Egyptians and the Greeks (section 2). In Philo's view, Abraham was a proto-Platonic philosopher with a keen interest in astronomy (section 3). Without exception, these Jewish authors appear to be acquainted with the topic of the first inventor (πρῶτος εὑρετής). Because this motif is first attested in 1 Enoch, whose authors lived under Ptolemaic rule in the third century BCE, it is likely that it was derived from Greek historiography and was mediated to the authors of 1 Enoch by historians like Hecataeus of Abdera. Later Jewish authors such as the author of Jubilees, Pseudo-Eupolemus, Philo and Josephus also applied the motif of the first inventor with re-

[45]Scott, *Origen and the Life of the Stars*, 7-9, 14, 16, for Plato's attitude towards Ionian astronomy. Cf. D. Furley, *The Greek Cosmologists*, vol. 1: The Formation of the Atomic Theory and Its Earliest Critics, Cambridge, etc. 1987, chap. 12, 169-176, on Plato's criticisms of the materialists.

gard to discoveries in the field of astronomy. This Greek motif proved to be an important tool in recycling authoritative Jewish figures like Enoch and Abraham.

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